

GMR 404/406

marine radar

installation instructions



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WELCOME

Thank you for choosing the Garmin GMR 404/406. These instructions help you assemble and install the GMR 404/406 radar. To install your Garmin chartplotter, consult the installation instructions packaged with the chartplotter.

Product Registration

Help us better support you by completing our online registration today! Connect to our Web site at www.garmin.com/registration/.

Use this area to record the serial number (8-digit number located on the back of the GMR 404/406 pedestal door, or on the product packaging) in case your GMR 404/406 needs service. Keep the original sales receipt, or a photocopy, in a safe place.

Serial Number: ____ _

Contact Garmin

Contact Garmin if you have any questions while using your GMR 404/406. In the USA contact Garmin Product Support by phone: (913) 397-8200 or (800) 800-1020, Monday–Friday, 8 AM–5 PM Central Time; or go to www.garmin.com/support/, and click

Product Support.

In Europe, contact Garmin (Europe) Ltd. at +44 (0) 870.8501241 (outside the UK) or 0808 2380000 (within the UK).



NOTE: The Garmin GMR 404/406 has no user-serviceable parts. If you encounter a problem with your unit, please take it to an authorized Garmin NMEA dealer or contact Garmin Product Support for repairs.

Packing List

Before installing and getting started with your unit, please check to see that your package includes the following items. **If any parts are missing, please contact your Garmin dealer immediately.**

Standard Package:

- GMR 404 or 406 radar pedestal and antenna
- Power/marine network cable
- Voltage Converter
- Hardware kit
- Installation manual

INSTALLATION

Installing the Scanner

The following section covers the assembly and installation of the GMR 404 or GMR 406 marine radar. The GMR 404 and 406 only operate with components of the Garmin Marine Network, and MFDs (multifunction displays). See your Garmin dealer or the Garmin Web site for more details. To complete the installation, you need the appropriate fasteners, tools, and mounts. These items should be available at most marine dealers. Always wear safety goggles, ear protection, and a dust mask when drilling, cutting, or sanding. When drilling or cutting, always check first to see what is on the other side of the surface. If you experience difficulty with the installation, contact Garmin Product Support or seek the assistance of a professional installer.



WARNING: The selected radar mounting location must be able to hold the weight of the radar and any inertial forces.

Installation Guidelines

To maximize the performance of the radar, please observe the following installation guidelines:

- An ideal scanner mounting location is high above the ship's keel line with a minimal part of the vessel's structure or rigging blocking the radar beam. Obstructions in the path of the radar beam may cause blind and shadow sectors, or generate false echoes. The higher the installation position, the further the scanner can detect targets.
- Avoid mounting the scanner on the same level as smoke stacks, horizontal spreaders, or crosstrees on a mast. Do not install the scanner near heat sources where it may be subjected to smoke or hot air from smoke stacks or heat from lights.
- The mounting surface or platform should be sturdy enough to support the weight of the radar and any inertial forces, flat as possible, and parallel with the vessel's water line.
- It is recommended that the scanner be mounted out of range of personnel (horizontal beam width above head height). When the scanner is transmitting, do not look directly at the antenna at close range, because the eyes are the most sensitive part of the body to electromagnetic energy. When properly installed and operated, the use of this radar conforms to the requirements of ANSI/IEEE C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields.
- A "Compass Safe Distance" must be maintained between the compass and the scanner. The Compass Safe Distance is measured from the center point of the compass to the nearest point on the scanner.

Standard compass = 3.28 ft (1 m)

Standby Steering and Emergency compasses = 1.97 ft (0.6 m)

- Mount other electronics and cables more than 7 ft (2 m) from the path of a radar beam. A radar beam can normally be assumed to spread 25° vertically above and below the scanner's radiating element. For vessels with higher bow angles at cruise speed, it may be helpful to lower the angle so the beam points slightly downward to the waterline while at rest. Shims may be used as necessary.
- Install the scanner away from antennas or other electronics. GPS antennas should be either above or below the radar beam path of the scanner. Mount at least 3 ft (1 m) from any equipment transmitting or cables carrying radio signals, such as VHF radios, cables and antennas. In the case of SSB radios, the distance should be increased to 7 ft (2 m). IEC 60936-1 clause 3-27.1 states maximum distances from the antenna at which RF (radio frequency) levels can be expected.

GMR 404 (100W/m squared = 60" [151 cm]) (10W/m squared = 187" [475 cm])

GMR 406 (100W/m squared = 75" [189 cm]) (10W/m squared = 236" [598 cm])

- The scanner transmits electromagnetic energy. It is important that the radar is turned off or the DC power input is disconnected when personnel are required to come close to the scanner to perform work on the scanner assembly or associated equipment.

Step ①

Install the Mounting Studs and Seals:

1. Remove the hatch on the front of pedestal by loosening the screw and lifting the hatch off of the hinges as shown in Figure 1.
2. Using a 5 mm Allen wrench, install the M10 x 71 mounting studs (Figure 2) in the pedestal matching the hole pattern that was selected. Tighten the mounting studs until they bottom out in the pedestal. **DO NOT** overtighten the studs because this may cause damage to the pedestal. The mounting studs have a thread locking patch applied at the factory.
OPTIONAL—Apply moisture inhibitive grease or paste to the four studs prior to installation.
3. Install the Seals onto the pedestal (Figure 3).

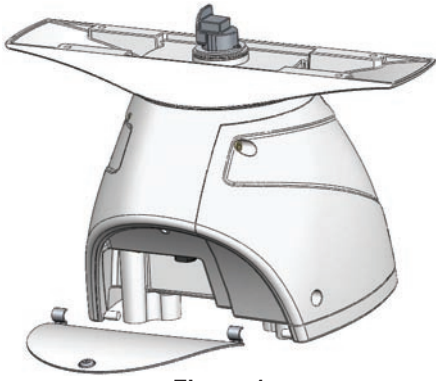


Figure 1

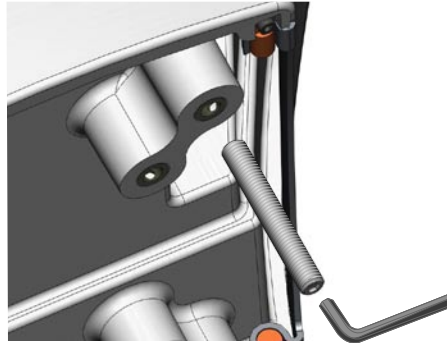


Figure 2

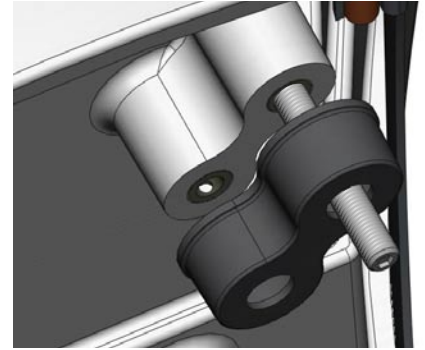


Figure 3

Step ②

Mount the Scanner

The scanner can be mounted with either end pointed toward the bow as long as it is mounted along the Bow-Stern Axis line indicated on the Mounting Template. If the end with the hatch is pointed toward the bow, the Bearing Offset in the chartplotter must be set to 180° (Figure 4).

To mount the scanner:

1. Determine a suitable mounting location and tape the Mounting Template in place. The Mounting Template has two hole patterns Option A and Option B. Determine which pattern fits your mount or better suits your mounting location. Using a Center Punch, indent the center of each mounting hole. Using a 13 mm (1/2") bit, drill the four mounting holes. (This step is not necessary if you are using a pre-drilled Garmin compatible Furuno® or Raymarine® mount).
2. Hoist the scanner into position using the supplied strap. Position the strap over the ends of the antenna mount as shown in Figure 5. Make sure that the strap is positioned as close to the scanner as possible.
3. Fasten the scanner to the mounting surface using the M10 hex nuts, spring washers, and flat washers in the order shown in Figure 6. **The M10 nuts should be torqued to 130 in.lbs (11 ft.lbs) (1.5 kgf.m).**

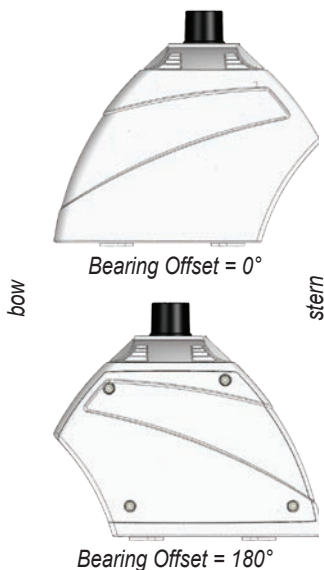


Figure 4

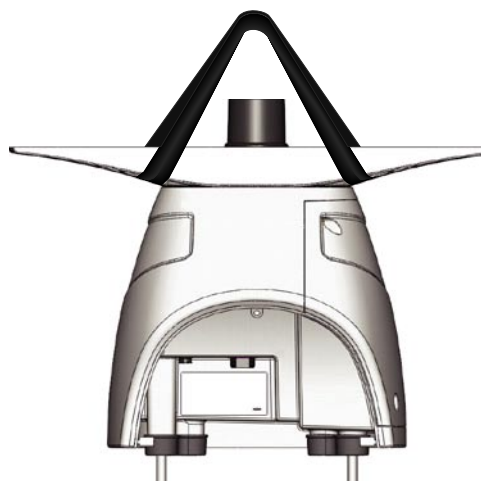


Figure 5

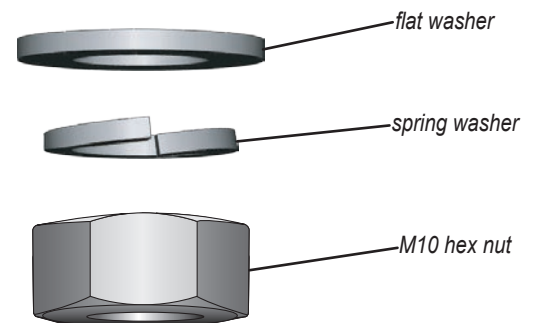
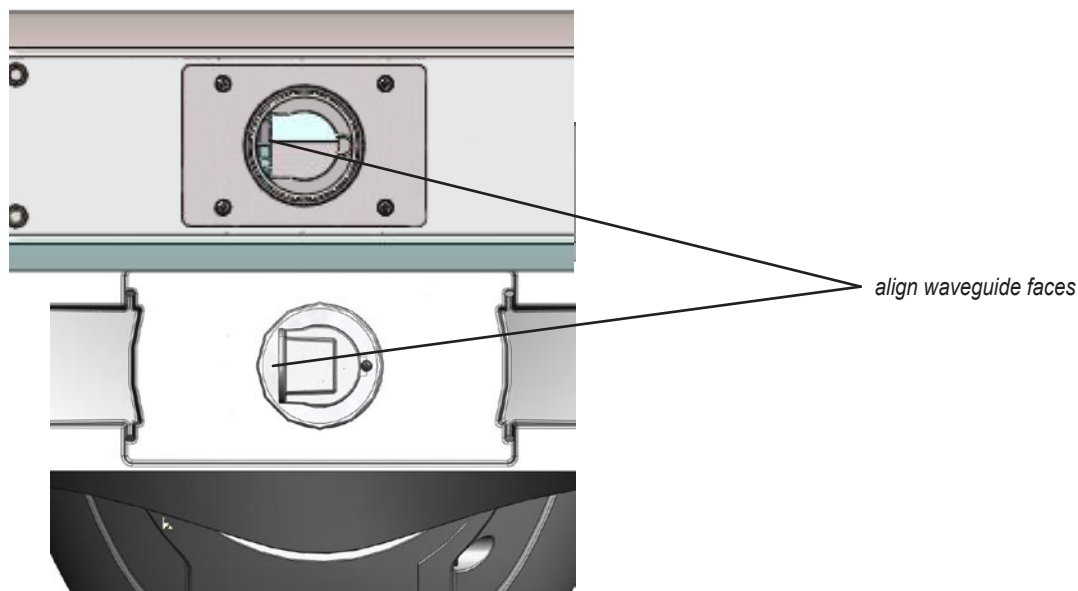


Figure 6

Step 3

Mount the Antenna:

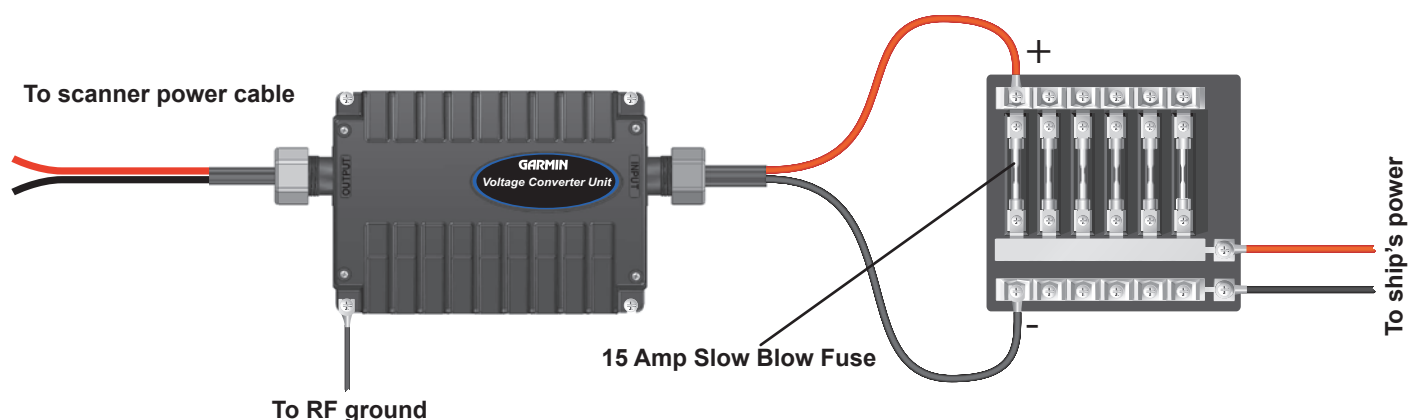
1. Remove the protective cover from the pedestal wave guide.
2. Verify that the antenna wave guide is aligned with the pedestal wave guide and slide the antenna onto the pedestal.
3. Secure the antenna to the pedestal using the 8 mm hex bolts and spring washers. **The 8 mm bolts should be torqued to 70 in.lbs (6 ft.lbs) (.81 kgf.m).**



Step 4

Install the Voltage Converter Unit

The voltage converter requires an input voltage of 10-40VDC and provides an output of 36 VDC. The converter must be fused using a 15 Amp slow-blow fuse. It is recommended that voltage converter be installed as close as possible to the selected power source. If the input wires need to be extended, follow the recommendations in Figure 7. If the wires are extended, use the supplied heat shrink butt connectors. After the connector is crimped, heat the connector to shrink it for a water resistant fit. For optimal performance, the voltage converter housing should be connected to the vessel's RF ground.



Distance	Gauge
3 meters (9.8 ft)	12 AWG
5 meters (16.4 ft)	10 AWG
6.5 meters (21.3 ft)	9 AWG
8 meters (26.2 ft)	8 AWG

Figure 7
Wire Gauge Table

Step 4

Install the Cable Assembly

Route the cable as needed, depending on the type of mount you are using. **DO NOT** cut the cable! It may be necessary to drill a 31.7 mm (1.25") hole for routing the power/network cable. Garmin provides a rubber cable grommet that can be used to cover the cable installation hole. The grommet does **NOT** provide a waterproof seal. To waterproof the grommet, apply a marine sealant. You can purchase additional cable grommets through Garmin or a Garmin dealer.

When installing the power/network cable, observe the following:

- To ensure safety, use the appropriate tie-wraps, fasteners, and sealant to secure the cable along a route and through any bulkhead or deck. Avoid running the cable near moving objects, high-heat sources, or through doorways and bilges.
- Avoid installing the cable next to or parallel to other cables, such as radio antenna lines, or power cables. This is essential to avoid interference to or from other equipment. If this is not possible, shield the cable with metal conduit or a form of EMI shielding.

To install the cable assembly:

1. Align the notch and locking ring on the power cable to the power connector. Press the 2-pin power cable to the power connector and the RJ-45 marine network cable to the RJ-45 socket. Turn the power cable locking ring clockwise until it stops. Tighten the RJ-45 locking ring clockwise until it is firmly sealed. (Figure 8)
2. The power/network cable can be routed through the front of the scanner (Figure 9), or through a hole drilled through the mounting surface (Figure 10). Avoid excessive bending or twisting of the cable.
3. Re-install the hatch on the front of the scanner.

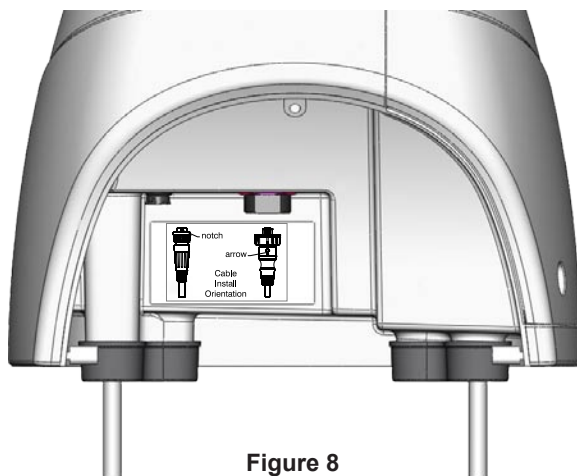


Figure 8

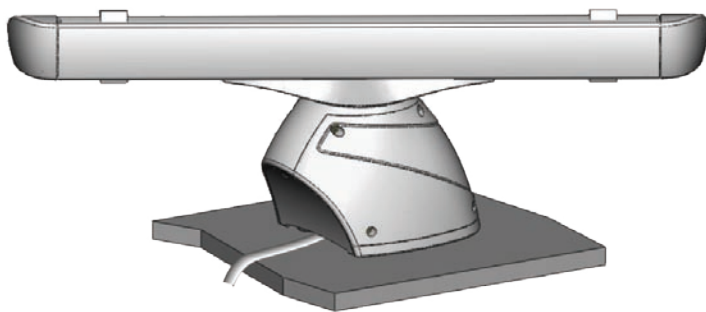


Figure 9

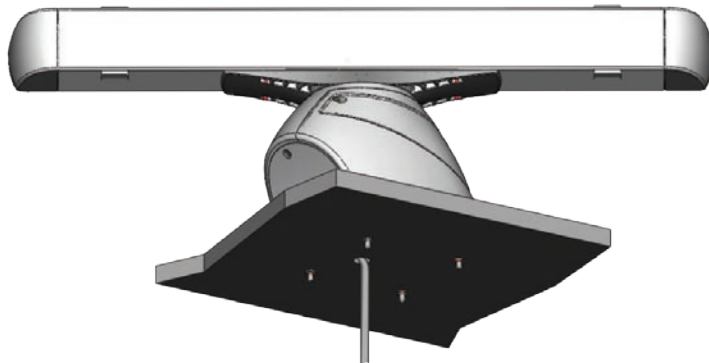


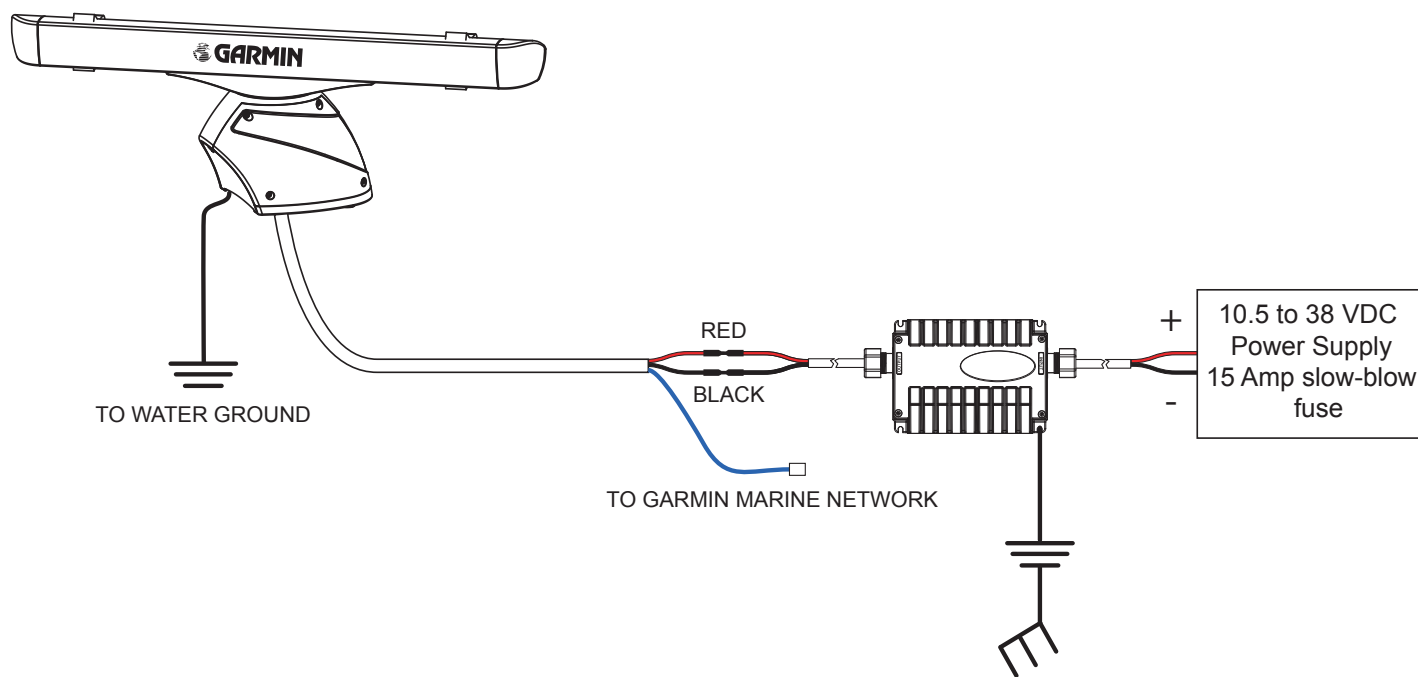
Figure 10

Step 5

Connecting the scanner

Connect the scanner power cable (Red and Black) to Voltage Converter output cable (Red and Black) using the supplied heat-shrink crimp connectors. DO NOT cut the scanner cable and DO NOT remove the in-line fuse located on the scanner power cable. After crimping the connections, heat the connectors to shrink the housing for a water resistant fit.

Connect the scanner to the vessel's water ground using an 8 gauge copper cable. The scanner connection should be made on one of the four mounting studs using a M10 nut and flat washer to secure the cable.



Wiring Diagram